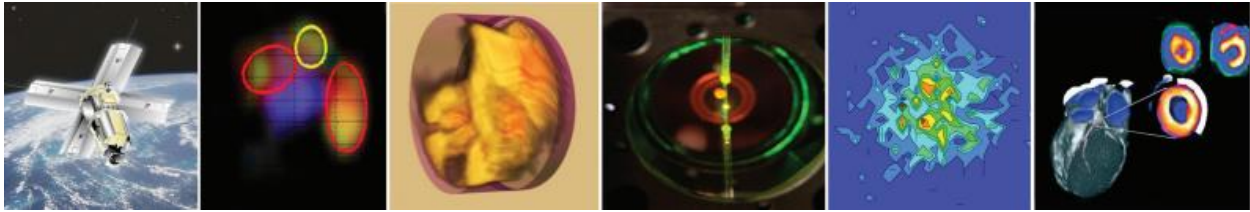


## **2014 Science of Signatures Advanced Studies Institute**

A professional development opportunity for advanced Ph.D. students and postdocs interested in learning skills needed for research program development at National Laboratories/Academia.



The Los Alamos National Laboratory (LANL)-Engineering Institute is planning to invite a multi-disciplinary (e.g. computer science, engineering, biology, physics, earth sciences, mathematics/statistics) group of advanced, highly accomplished Ph.D. students and post-doctoral researchers from around the country to come to Los Alamos National Laboratory for an opportunity to work on multi-disciplinary teams to generate novel, creative solutions to pressing national security problems and build the skills needed for successful research program development at national laboratories and in academia. This program will focus on introducing Advanced Studies Scholars to the process of writing winning proposals and securing research funding.

LANL's evolving national security mission currently requires a new research focus on the forward deployment of advanced measurement technologies (Science of Signatures). LANL has identified a set of multi-disciplinary, highly-challenging Science of Signatures-Forward Deployment research gaps related to pertinent national security challenges. Advanced Studies Scholars will work in multidisciplinary proposal teams of 3 to generate novel research solutions to these important challenges. Under the guidance of LANL mentors, the scholars will complete preliminary feasibility studies of their concepts and summarize their results in a proposal format. Their professional development will be enhanced not only by technical presentations and interactions, but also by providing them with advice and guidance from experienced researchers on how to develop research programs, write proposals, and secure funding. The scholars will present their proposals to a group of program managers for critique and feedback. They will also have the opportunity to interact with multi-disciplinary researchers from around the country to facilitate future career opportunities and collaborations. Scholars will have the opportunity to shape new fields. This program will be three weeks in duration. Expenses will be paid for external candidates' travel, lodging, and subsistence for the duration of the program.

Charles Farrar of the LANL Engineering Institute has run the highly successful LANL Dynamic Summer School (LADSS) undergraduate research experience for more than a decade. LADSS alumni have gone on to win numerous NSF, NDSEG, and NASA graduate fellowships, LANL Director's funded postdoctoral fellowships, and currently hold faculty positions as well as technical staff positions at numerous National Laboratories. The lessons learned from the LADSS have been used to tailor this professional development experience to help aspiring young researchers move to the next stage of their career in academia or research at national laboratories.

**Advanced Studies Scholars must be U.S. citizens or permanent residents.**

**For consideration to this program please submit a CV, 1 letter of recommendation, and a brief (~1page) synopsis of your professional goals, and interest in participating as an Advanced Studies Scholar to Jutta Kayser: [jkayser@lanl.gov](mailto:jkayser@lanl.gov) by January 17, 2014**

**Program will run from April 14-May 2, 2014**

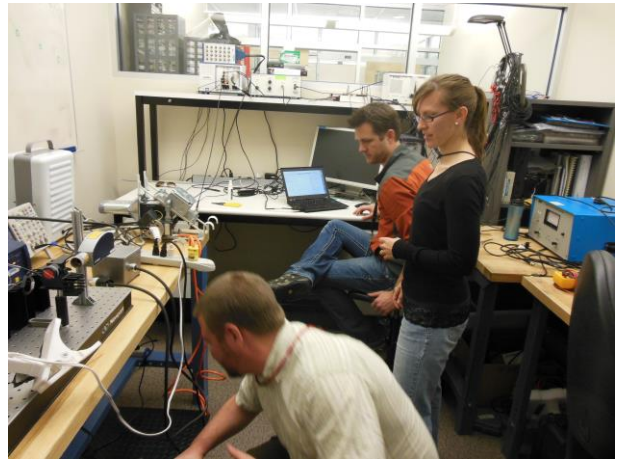
**Please direct questions to David Mascareñas ([dmascarenas@lanl.gov](mailto:dmascarenas@lanl.gov))**

## Prior Projects from 2013

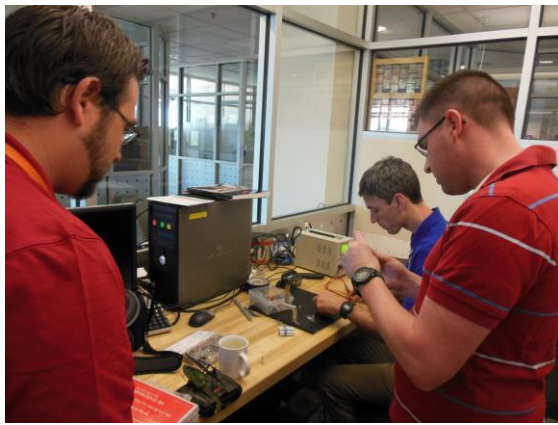
Program Overview: <http://www.youtube.com/watch?v=hq03MsP1MPI>



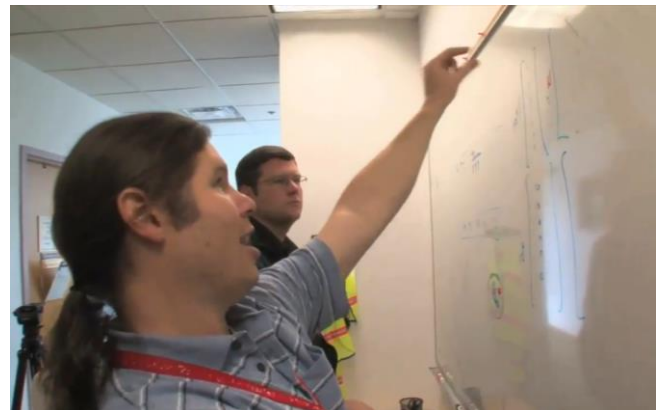
Remote Physical Sample Collection Using Unmanned Aviation Systems (UAS)



Characterizing the power grid



Novel methods for detecting small Unmanned Aviation Systems (UAS)



Novel signatures for characterizing chem/bio manufacturing facilities

## Selected Technical Lectures from 2013

- Nuclear Detection (Karen Miller, NEN-1)
- Estimation of Electrical Load Dynamics (Scott Backhaus, MPA-CMMS)
- Biosensors: From the Bench to the Field (Harshini Mukundan, C-PCS)
- Statistical Electromagnetics (John Galbraith, P-21)
- Mobile Robots (Chris Ory, EO-ER)
- Bio-inspired Computing (Garrett Kenyon, P-21)
- History of the Los Alamos Neutron Science Center (LANSCE) (Dan Rees, AOT-RFE)

## Selected Professional Development Lectures from 2013

- Evaluation of Past Proposals (Bill Priedhorsky, LANL LDRD)
- How to Build a Successful Research Program (Michelle Espy P-21)
- Fundamentals of Proposal Writing (David Clark, NSEC Division Leader)
- Transitioning from Student to Faculty (Mike Todd, Prof at UCSD)
- Building Effective Partnerships (Karl Jonietz, Former US State Department)
- The exciting outcomes and perils involved with STE consortia (José Olivares, Biology Division Leader)
- Lessons Learned in Building a Research Program in Academia (Donald Leo, Dean of the University of Georgia)
- Science and Technology Policy: How the programs we know get their start (John Szymanski, DSA-DO)
- Building a Start-up Company (Duncan McBranch, PADGS Global Security)